

U. S. Bureau of Entomology & Plant Quarantine  
Forest Insect Laboratory  
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MEMORANDUM ON THE INSPECTION OF THE BLACK HILLS BEETLE  
INFESTATION IN PONDEROSA PINE IN THE DIXIE NATIONAL FOREST, UTAH

An infestation of the Black Hills beetle, Dendroctonus ponderosae Hopk., has recently built up to epidemic proportions in ponderosa pine on the Sevier Division of the Dixie National Forest in southern Utah. This Division of the forest lies east of Cedar City. The epidemic reported at present covers several thousand acres lying largely south of Panguitch Lake between Blue Springs Creek and Mammoth Creek.

This area was visited on October 3 and 4, in company with Associate Forester Mathews and Ranger Hurst. An examination of infested trees showed that the Black Hills beetle, Dendroctonus ponderosae Hopk., was the primary insect attacking and killing the trees. Associated with this beetle in the base was the Southwestern pine beetle, D. harborei Hopk., which frequently occupied the basal five feet of the bole. Although the Southwestern pine beetle when numerous is capable of killing healthy trees, it appears to be of minor importance in this area at present compared to the Black Hills beetle. In some trees it may occupy as much as 10 or 15 feet of the bole, the remainder of the trunk being attacked by the primary species.

At the time of the examination larvae of both species were found partially grown and feeding away from the egg galleries. However, in several instances adults of the Southwestern pine beetle were observed just entering the bark of trees already infested, indicating that some of the attacks by this species may occur rather late in the season. The few groups of trees examined contained from three to ten infested trees in a group, but it is likely that much larger groups are present. Groups of red tops are conspicuous over the area. It is the opinion of local forest officers that the infestation has shown an increase over last year and it is evident that the epidemic should be controlled before it becomes more serious. Some control work was undertaken from the Duck Creek CCC camp last spring, the work being confined to the north end of the infested area. However, only a comparatively small area was covered, the work being discontinued because of emergence of the beetles.

At a conference of forest officers, following the examination on October 3, it was decided to make a 100 percent survey of the area, marking and mapping in all infested trees for later treatment. Although the CCC camp was due to move to winter quarters in a short time it was hoped that some treating could be done before this move was made. With

the trees located by the survey it was possible that at least the accessible timber might be disposed of by special use during the winter. The remaining trees would have to be treated next spring. A spotting crew of five men, under the supervision of MCW Foreman Thomas, was organized the evening of October 3 and began work the next day. Mathews and the writer spent the 4th in training this crew in the field.

On the Sevier Division of the Dixie Forest the main ponderosa pine type lies on the east side, where the present infestation occurs. It was reported that the belt of ponderosa pine was several miles wide, this strip extending from the general vicinity of Panguitch Lake south to near the south boundary, apparently a distance of 15 or 20 miles. Scattered trees evidently also spread for some distance to the east of this main body of timber. A serious outbreak of the Black Hills beetle occurred in this area a number of years ago, destroying thousands of trees. Large groups of these old, dead trees remain as evidence of the destruction, although a majority of the snags have fallen - breaking off just below the ground line. Ranger Hurst stated that this epidemic continued from about 1918 up to 1925, and in some places as much as 15 percent of the stand was destroyed. It is interesting to note that this epidemic coincided with a very serious outbreak in the Kaibab Forest in northern Arizona. Both outbreaks apparently died out the same year.

The present infestation is located near the north end of the ponderosa pine belt and so far has not been reported from other parts of this stand. It is possible that the Black Hills beetle is building up in other areas where it has not yet been detected. Consequently it is suggested that the remainder of this type be scouted for evidence of dying trees. If groups of five to seven or more fading trees are prevalent in area it is likely that an epidemic condition is starting, and a more intensive examination of such areas should be made. An occasional fading tree can doubtless be found in any part of the stand and if these occur only as scattered individuals the situation is probably not serious.

#### Control Measures

Several trees cut at the close of the control operation last spring were examined. These particular trees had not been thoroughly treated; the lower bole had been peeled but a considerable length of the upper bole, also infested with the Black Hills beetle, was left unpeeled. Some of the large limbs had also been infested but were untreated. Whether this was typical or happened to be some of the last trees felled was not determined.

It is essential that the entire infested length of the bole and the infested portion of the limbs be treated. The infested stumps should be peeled. Large limbs, usually those over eight inches in diameter, are apt to be attacked on a heavily infested tree. The bark should be cut through in several places when such limbs are trimmed off to determine if any galleries of the Black Hills beetle are present and how far out they extend.



It is not necessary to treat that portion of the bole or limbs which are not infested with the *Dendroctonus* beetles. The height of attack by these beetles will vary greatly in different trees, sometimes running up to a six inch top diameter but in other cases including only the lower half of the bole, or even less. The uninfested portions are commonly attacked later by species of *Ips* but these beetles can be disregarded and need not be treated. The *Ips* galleries can be distinguished by the fact that they are kept open and free of boring dust; the gallery consisting of several branches radiating from a central point or nuptial chamber. The *Dendroctonus* galleries are always packed full of boring dust; the Black Hills beetle making a single, long, straight gallery running with the grain of the wood; the Southwestern pine beetle a somewhat narrower gallery which winds in all directions. For treatment, the bole should be cut off several feet above the last *Dendroctonus* gallery since the infestation may run higher on the under side of the log.

For the Black Hills beetle, which works between the bark and the wood in all stages, peeling the bark is a satisfactory method of control during the period that the insect is in the larval stage. However, after the larvae pupate and begin turning to new adults peeling becomes less and less effective as the number of adults increases. It is likely that most of the mature beetles not injured mechanically during the peeling operation would escape and be able to enter other trees. During a normal season, peeling would probably be effective until the first week in June, but after new adults begin to appear in any numbers burning is necessary for satisfactory control. Burning could be continued into July or until the beetles begin to emerge from the trees.

With the Southwestern pine beetle the young larvae, soon after hatching, work out into the outer bark where they continue to feed until mature. Consequently peeling would not expose these larvae nor prevent their development in the dry bark. Burning the infested logs is the only suitable control for this beetle, and if the bark is peeled it must be burned.

On this project the burning of all infested trees would give the best results, destroying both species of *Dendroctonus*. It was anticipated that this method could be used. Although the Southwestern pine beetle appears to be of minor importance, and might be disregarded without much danger if only peeling was utilized for the other species, it is a good precautionary measure to treat for both beetles at this time.

In burning ponderosa pine a mere scorching or blackening of the bark is not sufficient. In order to ensure a complete destruction of all the insects the bark should be burned from the logs. Crew foremen should check these logs after treatment to make certain that the work is being thoroughly done.

Where infested trees occur in groups it will often be possible to deck the logs and with a suitable fire line burn them in this position, if conditions permit a large fire. Large trees, difficult to handle in this manner can be felled and burned in place. Such trees should be

felled on low skids to facilitate burning the under side. The uninfested top can be lopped and thrown out, the infested limbs piled along or over the bole for burning. Where there is little inflammable material to pile over the log a strip of bark about eight inches wide should be peeled along the top before the fire is set since this strip seldom receives a sufficient burn. Less fire can be used where a tree is cut into lengths and these rolled side by side on low skids. After the sides are burned the logs can be given a partial turn to treat the upper surfaces. When this operation is completed the logs should be rolled apart, thus permitting the fire to die out rapidly. This method, with the litter raked out or burned inside a narrow fire line and limiting burning to the morning hours, has been safely used under very dry conditions.

When infested trees are taken out for special use and utilized in or near the forested area the logs from these trees can be peeled, and this treatment should be completed before the first of June. Where the logs are cut at a sawmill the slabs should be burned before the middle of June, or preferably earlier, to make sure that no beetles emerge.

Last spring a few Douglas fir mixed with the pine were treated during the control operation. These trees were infested with the Douglas fir beetle, Dendroctonus pseudotsugae Hopk., which is similar in appearance and has a gallery much like that of the Black Hills beetle. The Douglas fir beetle appears to be more or less sporadic and since it very likely occurs in adjacent areas in the forest there would be little gained by treating only the present limited area in the pine stand. Since the Black Hills beetle cannot develop in Douglas fir it was recommended that this tree species be disregarded in the present control project.

Besides ponderosa pine, limber pine is also a normal host of the Black Hills beetle. Some limber pine occurs in parts of the present infested area and trees which had been infested with this beetle were found. Therefore, as was recommended at the time of the examination, both the ponderosa pine and the limber pine should be examined for new attacks and all infested trees treated.

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